

Water Banks in Mexico

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National Water Commission

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## Introduction

Water Banks in Mexico are water resources management tools, which aim to contribute towards ensuring the sustainability of the resource. The present document refers to the normative and policy framework in Mexico that supports the operation of Water Banks, and the need to consider the trends in the transfer of rights and their future perspectives, in combination with other elements of water policy.

In order to outline the institutional design of these bodies, international experiences were reviewed which allowed the operation of similar figures in other regions to be studied, reaching the conclusion that for the case of Mexico it was essential first and foremost to attend to the legal and administrative regime for water, considered as a public asset and therefore the responsibility of the Federation, in order to provide Water Banks with a public nature.

The *raison d'être* of Water Banks, the services they provide and their main advantages, among which it is worth mentioning the integral and specialized advice to the users of the nation's water resources, both regarding the hydrological conditions of a region and the procedure for the three means of transferring rights; the openness of information for appropriate decision making, certainty and transparency are fundamental aspects of their operation.

These bodies will continue to develop in order to increase the activities they carry out, heightening the efficiency in the transfer of rights, discouraging the informal market and generating a greater acceptance from the users of the nation's water resources.

The analysis of information and the management of computing tools which facilitate the aforementioned are part of the activities that will be intensified so as to achieve the consolidation of Water Banks in Mexico.

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## 1. Reference framework

### 1.1 Legal basis

The legal basis for the creation of Water Banks in Mexico can be found first and foremost in the Political Constitution of the United Mexican States, in its Article 27, as well as in the National Water Law, which regulates that Article.

#### 1.1.1 Political Constitution of the United Mexican States

Article 27 of the Constitution establishes textually that “Ownership of the lands and waters within the boundaries of the national territory is vested originally in the Nation, which has had and will have the right to transfer the ownership of the latter to private parties, thus constituting private property”.

The fifth paragraph establishes that:

“In the Nation is likewise vested the ownership of the waters of the territorial seas, within the limits and terms fixed by international law; inland marine waters; those of lagoons and marshes permanently or intermittently connected with the sea; those of naturally formed inland lakes which are directly connected with constant streams; those of rivers and their direct or indirect tributaries from the point in their flow where the first permanent, intermittent, or torrential waters commence, to their mouth in the sea, or a lake, lagoon, or marshes which are the property of the nation; those of constant or intermittent streams and their direct or indirect tributaries, whenever the whole or part of its course serves as a boundary of the national territory or of two states, or if it flows from one state to another or crosses the dividing line of the Republic; those of lakes, lagoons, or marshes whose basins, zones or shores are crossed by the dividing lines of two or more states or between the Republic and a neighboring country or when the shoreline serves as the boundary between two states or between the Republic and a neighboring country; those of springs that flow from beaches, maritime areas, the beds, basins, or shores of lakes, lagoons, or marshes that are the property of the nation; and waters extracted from mines and the channels, beds, or shores of inland lakes and streams in an area fixed by law. Subsoil waters may be freely extracted by manmade works and utilized by the land owner, but if the public interest so requires or other uses are affected, the Federal Executive Branch may regulate its extraction and utilization, and even establish prohibition zones, as may be the case for other waters that are the property of the nation.”

“...ownership by the Nation is inalienable and imprescriptible, and the exploitation, use, or appropriation of the resources in question, by private persons or by companies constituted according to Mexican laws, may not be undertaken except through concessions granted by the Federal Executive Branch, in accordance with rules and conditions established by law.”

#### 1.1.2 National Water Law

As already indicated, the National Water Law (*Ley de Aguas Nacionales* or LAN in Spanish) regulates Article 27 of the Political Constitution of the United Mexican States, regarding the nation's water resources. Its purpose is to regulate the exploitation, use, or appropriation of these resources, their distribution and control, as well as the preservation of their quantity and quality to achieve an integral and sustainable development. For the purpose of the Law, the nation's water resources are those referred to in the fifth paragraph of Article 27 of the Constitution.

Article 4 of the LAN establishes that "the authority and administration regarding the nation's water resources and its inherent public assets is the responsibility of the Federal Executive Branch, who will exercise it directly or through "the Commission"; referring to the National Water Commission.

Article 9 establishes that "the Commission" is a decentralized administrative body of the Ministry of the Environment and Natural Resources, which has the purpose of exercising the attributions of the authority for water issues and of being constituted as a Superior Body of the Federation for technical, normative and consultative issues, regarding integrated water resources management, including the administration, regulation, control and protection of public water resources.

Along these lines and in particular as regards the exploitation, use, or appropriation of the nation's water resources, these activities should be carried out through concession or assignment granted by the Federal Executive Branch through the National Water Commission (CONAGUA), as established in Article 20 of the LAN.

The concession deeds can be transferred definitively, in total or partially, according to the provisions of Article 33 of the aforementioned Law.

On this subject and more specifically, Article 37 Bis establishes that "The Commission" may establish definitive or temporary bodies in which regulated operations of right transfers are managed, which will be named "Water Banks", the functions of which will be determined in the corresponding regulations.

Currently, this is the only article within the LAN which refers to the figure of Water Banks, since there is no reference to them in the By-Laws of the National Water Law (RLAN). This is a result of the reforms that the National Water Law underwent in the month of April 2004, which was not the case for the By-Laws which depend upon it.

Legal basis of Water Banks

Political Constitution of the United Mexican States (Article 27)

National Water Law

#### Article 4

Federal Executive Branch / CONAGUA:

- Authority regarding the nation's water resources and its inherent public assets

#### Article 9

CONAGUA:

- Decentralized administrative body of SEMARNAT
- Superior body of the Federation for technical, normative and consultative issues regarding integrated water resources management

#### Article 20

Federal Executive Branch / CONAGUA:

- Granting concessions or assignments

#### Article 33

CONAGUA

- Transfer of deeds  
(Definitive, total or partial)

#### Article 37 Bis

CONAGUA

- Establishment of "Water Banks"

#### 1.1.3 By-Laws of the National Water Commission

In the By-Laws (*Reglamento Interior* or RI in Spanish) of the National Water Commission the administrative units are listed that make up the CONAGUA both at the national and the hydrological-administrative regional levels.

In the first of the two levels mentioned, we find the Deputy Director General's Office for Water Administration (SGAA in Spanish), whose attributions are listed in Article 24 of the By-Laws, among which the following should be mentioned:

Article 24. The following attributions are the responsibility of the Deputy Director General's Office for Water Administration:

II. Authorizing the administrative instruments referred to in Article 14, section V, of these By-Laws regarding:

- o) Transfer of water rights, and
- p) Establishment, operation, granting and revocation of authorizations and registration of Water Banks

Within the areas attached to this Deputy Director's Office is the Department of Regulation of Right Transfers, Water Banks and Information Control, among whose attributions are the following:

Article 29. The following attributions are the responsibility of the Department of Regulation of Right Transfers, Water Banks and Information Control:

I. Approving the projects of administrative instruments referred to in Article 24, section II of these By-Laws regarding:

- a) Constitution, authorization and revocation of authorizations of Water Banks;
- b) Operation and registration of acts of Water Banks, as well as their evaluation;

III. Proposing the granting and revocation of authorizations for the constitution of Water Banks;

IV. Studying, developing and proposing management indicators to evaluate the performance of Water Banks;

In this way, it can be inferred that in the Political Constitution of the United Mexican States, in the National Water Law and in the By-Laws of the National Water Commission, we may find the legal basis for the creation of Water Banks.

By-Laws of the CONAGUA - Water Banks

(Competence of the administrative units at the national and regional hydrological-administrative levels)

SGAA

Article 24

GRTDBACI

Article 29

## 1.2 Water Banks in National Policy

### 1.2.1. National Development Plan

The 2007-2012 National Development Plan (PND in Spanish) defines Sustainable Human Development as a basic premise for the integral development of the country, and contains five chapters that are related to each of the major lines of public policy which are:

1. Rule of law and security
2. Competitive, job-creating economy
3. Equality of opportunities
4. Environmental sustainability
5. Effective democracy and responsible foreign policy

Major line 4, Environmental Sustainability, refers to the efficient and rational administration of natural resources, with the aim of improving the wellbeing of the nation's population without compromising the standard of living of future generations. In the case of water, it recognizes the importance of protecting surface water and groundwater, as well as the quality of water bodies.

On the topic of the Sustainable Use of Natural Resources, objective 2 refers to "Achieving an integrated and sustainable management of water", indicating particularly in item 4.1. Water, that "the necessary strategies will be integrated for the creation of Water Banks with the purpose of carrying out water rights transfer operations between users in a regulated manner".

National Development Plan (2007 – 2012)  
Sustainable Human Development

Environmental Sustainability (Line 4)  
Sustainable Use of Natural Resources (4.1 Water)  
Achieving an integrated and sustainable management of water (Objective 2)  
Creation of Water Banks

#### 1.2.2 Environment and Natural Resources Sector Program

The Environment and Natural Resources Sector Program (PSMARN in Spanish) takes environmental sustainability as its main reference framework, which fully relates it with the National Development Plan, which in turn refers to sustainability as one of the major lines that composes it.

The Program recognizes that the depletion and degradation of natural resources is increasingly a restriction for the development of productive activities and of life itself.

The environmental policy of the present administration promotes the design and application of regulatory and management instruments; in particular, the Program has a specific section identified as "Blue Agenda: Integrated Management of Water Resources". Within this agenda, the great challenges facing the water sector are recognized, such as guaranteeing integrated water resources management through sustainable catchment and aquifer management. In the section on the objectives of that agenda, 5.3.3 is worth mentioning, since it sets out to promote "Integral and Sustainable Catchment and Aquifer Management", as well as presenting a strategy and a line of action related with Water Banks, which are quoted as follows:

"Strategy 2. Developing economic incentives and instruments that foster the preservation of ecosystems."

"Line of action: Operating Water Banks."

Environment and Natural Resources Sector Program (2007 – 2012)

Blue Agenda

## Integrated Water Resources Management

### Objective 5.3.3

Promoting integrated catchment and aquifer management

#### Strategy 2

Develop economic incentives and instruments that foster the preservation of ecosystems

#### Line of action

Operating Water Banks

#### 1.2.3. National Water Program

Within the framework of Sustainable Human Development, the appropriate management and preservation of water plays a fundamental role and is related with social wellbeing, economic development and the preservation of ecological wealth.

Mexico is facing major challenges regarding water resources, associated both with the natural characteristics of the territory itself and the intense population growth.

Additionally, in Mexico the effects associated with climate change are increasing, thus resulting more severe damage resulting from the hurricanes and droughts that periodically occur.

The 2007–2012 National Water Program (PNH in Spanish) picks up on the concepts, proposals and targets of the National Development Plan, as well as the Environment and Natural Resources Sector Program, and is developed based on eight objectives, each of which presents specific strategies with associated targets.

The particular case of the theme under analysis, Water Banks, is mentioned in Objective 3, which is textually stated as “Promote integrated and sustainable water management in catchments and aquifers”; the corresponding strategy is the following:

Strategy 3: “Develop the economic incentives and instruments that foster the preservation of the country’s rivers, lakes, wetlands, catchments, aquifers and coasts” with the specific indicator on Water Banks in operation.

#### National Water Program

(2007 – 2012)

#### Objective 3:

Promote integrated and sustainable water management in catchments and aquifers

#### Strategy 3:

Develop economic incentives and instruments that foster the preservation of the country’s rivers, lakes, wetlands, catchments, aquifers and coasts

### Indicator 3.3.1

#### Water Banks in operation

The PNH also refers to Water Banks as instruments that will contribute to regulating the market of water rights in Mexico, contributing to the efficient use of the resource redressing their overdrafting. They will be bodies that will manage regulated operations of right transfers to avoid stockpiling of the resource and the consequent generation of economic income. The expectation is that these figures will facilitate a modern water administration in accordance with the dynamic conditions that govern the market of water rights.

#### 1.3 Transfers of Rights in Mexico

In accordance with article 20 of the LAN, the appropriation, use or exploitation of the nation's water resources is carried out through concession, by a deed granted by the CONAGUA which confers its holder with the rights and obligations determined by the same legal ordinance.

Among the rights constituted on the holder's behalf, section IV of article 28 of the LAN establishes the right to transfer the rights of the deed(s) granted to him or her, which according to the regulations of article 33 of the LAN is conditioned to the filing and authorization of the procedure by the water authority in terms of the regulations in article 64 to 72 of the RLAN, whether it is a general transfer, for succession or legal adjudication, or for a change of holder without the characteristics of the concession deed being modified.

Notwithstanding the legal and regulatory dispositions, the transfer of rights in practice has presented difficulties and generated the following problems.

##### 1.3.1 Problems affecting transfers

There are currently various factors, both internal (CONAGUA) and external (the users), which impact the transfer of rights.

Among the external factors are those related with the user and the lack of a culture of the transfer of rights:

- The lack of knowledge on the normativity to carry out the transfer of rights
- The perception from the users that the procedure is difficult to carry out
- The existence of an informal market

Additionally we should consider the particular conditions of water resources in Mexico, such as the availability, overdrafting, pollution or prohibition zones, which added to the population growth, affect these problems.

These factors result in informal practices in the transfer of rights, meaning those out of the hands of the water authority, which has brought about the existence of an unregulated water market, generating uncertainty and stockpiling.

## 1.3.2 Evolution

### 1.3.2.1 Requests for the transfers of rights

In the period 2001-2006, the SECTRA registered a total of 10,819 requests for the transfers of rights.

Number of requests for the transfer of rights, 2001-2006

Source. Data from the Procedure Follow-up and Control System (SECTRA)

Of the requests for the transfer of rights, 64.41% were concentrated in four River Basin Organizations: Lerma-Santiago-Pacific, Central Basins of the North, Rio Bravo and Baja California Peninsula.

Requests for the transfers of rights in Mexico by River Basin Organization, 2001-2006

Lerma-Santiago-Pacific  
Central Basins of the North  
Rio Bravo  
Baja California Peninsula  
Northern Gulf  
Northwest  
Northern Pacific  
Waters of the Valley of Mexico  
Balsas  
Southern Border  
Central Gulf  
Yucatan Peninsula  
Southern Pacific

Source. Data from the Procedure Follow-up and Control System (SECTRA)

The transfers of rights for the use in agriculture were the most numerous during the period under analysis.

Transfers of rights in Mexico by River Basin Organization, 2001-2006

Lerma-Santiago-Pacific  
Central Basins of the North  
Northern Pacific  
Rio Bravo  
Baja California Peninsula  
Northern Gulf

Northwest  
Southern Border  
Central Gulf  
Balsas  
Yucatan Peninsula  
Waters of the Valley of Mexico  
Southern Pacific

Source. Data from the Public Registry of Water Rights (REPD)

The sector with the greatest demand for transfers was the agricultural, which concentrated 67.3% of the transfers registered.

### 1.3.3 Relationship with key elements of Water Policy

The National Water Program establishes water policy, and is aligned with the Environment and Natural Resources Sector Program and the National Development Plan, according to which the priorities, objectives and strategies of the federal public administration for the 2007-2012 period are established. These documents recognize the essential value of water as a strategic element to meet the basic needs of the population and to boost the development of the country's economic activities, within a framework that privileges Sustainable Human Development and caring for and preserving the environment.

In this way the PNH establishes the strategies and actions to face the existing problem around issues such as: the availability of water; the degree of water stress; overdrafted aquifers; water quality as well as meteorological phenomena, among others. These factors are related to the demand on water from the different sectors of users and therefore with the transfer of rights, in such a way that the elements of water policy have an impact on the trends in the transfers of rights.

#### 1.3.3.1 Availability of water

One of the most used indicators to classify countries according to their availability of water can be reached by dividing the renewable water resources by the number of inhabitants, thus obtaining the mean natural per capita availability, which in the particular case of Mexico has been gradually decreasing over time, mainly due to population growth, since from the 18,035 m<sup>3</sup> per inhabitant per year available in 1950, the volume had dropped to 4,771 by 2000.

With the aim of visualizing in greater detail the variation in the availability in different areas of Mexico, the following table presents the availability by River Basin Organization for 2010 and is contrasted against the estimated availability for 2030.

Mean natural per capita availability by River Basin Organization (m<sup>3</sup>/inhabitant/year)

River Basin Organization

Mean natural per capita availability in 2010  
Mean natural per capita availability in 2030

I Baja California Peninsula  
II Northwest  
III Northern Pacific  
IV Balsas  
V Southern Pacific  
VI Rio Bravo  
VII Central Basins of the North  
VIII Lerma-Santiago-Pacific  
IX Northern Gulf  
X Central Gulf  
XI Southern Border  
XII Yucatan Peninsula  
XIII Waters of the Valley of Mexico  
Total

Source: Statistics on Water in Mexico, Edition 2011

In this sense, the Baja California Peninsula, Rio Bravo and Waters of the Valley of Mexico River Basin Organizations are those that will have the lowest per capita availability of water, and it is thus considered that they could be the venue for an increase in the number of transfers of rights.

#### 1.3.3.2 Degree of water stress

The degree of water stress, as indicated in the publication "Statistics on Water in Mexico", is determined by dividing the total volume of water allocated by the mean natural availability of water, both factors that directly impact the transfers of rights.

Degree of water stress by River Basin Organization

River Basin Organization  
Total ATR  
Percentage  
Degree of water stress (%)

Lerma-Santiago-Pacific  
Central Basins of the North  
Northern Pacific  
Rio Bravo  
Baja California Peninsula  
Northwest  
Balsas

## Waters of the Valley of Mexico Accumulated percentage

Source: Produced based on data from the REPDA and Statistics on Water in Mexico, 2011

As may be observed in the following map, 81% of the authorized transfers of rights (ATR) in the period 2001-2006 were in the areas under a high degree of water stress.

For this reason, it is considered that this factor will continue to exert a decisive impact on the transfers of rights, especially in the northern and central areas of Mexico, where the greatest demand for water and thus the greatest degree of water stress exist.

## Authorized transfers of rights 2001 – 2006 and degree of water stress by River Basin Organization

Northwest  
Rio Bravo  
Central Basins of the North  
Waters of the Valley of Mexico  
Balsas  
Lerma-Santiago-Pacific  
Northern Pacific  
Baja California Peninsula

81% of the transfers authorized

Water stress  
< 10% no stress  
20% - 40% medium  
>100% very high

Source. Produced based on the Cartography of the Office for Geographic Information on Water (SIGA), with data from the REPDA and Statistics on Water in Mexico, 2011

### 1.3.3.3 Overdrafted aquifers

A large percentage of the transfers of rights corresponds to groundwater (around 65%); even more so in the areas where there are overdrafted aquifers, where it is not possible to grant new concessions, meaning that an option to obtain volumes of water will be through the transfers of rights.

Overdrafted aquifers by River Basin Organization,

River Basin Organization  
Number of overdrafted aquifers in 2009

I Baja California Peninsula  
 II Northwest  
 III Northern Pacific  
 IV Balsas  
 V Southern Pacific  
 VI Rio Bravo  
 VII Central Basins of the North  
 VIII Lerma-Santiago-Pacific  
 IX Northern Gulf  
 X Central Gulf  
 XI Southern Border  
 XII Yucatan Peninsula  
 XIII Waters of the Valley of Mexico  
 Total

Source. Statistics on Water in Mexico, 2011

For 2009, nearly 54% of groundwater was extracted for all uses from the 100 overdrafted aquifers. 82% of these aquifers are concentrated in 4 River Basin Organizations: Lerma-Santiago-Pacific, Central Basins of the North, Rio Bravo and Northwest, where 52% of the transfers of rights were authorized.

Authorized transfers of rights, 2001-2006 and overdrafted aquifers, 2009

River Basin Organization  
 Total ATR  
 Percentage  
 No. overdrafted aquifers

Lerma-Santiago-Pacific  
 Central Basins of the North  
 Rio Bravo  
 Northwest  
 Total

Source. Produced based on data from the REPDA and Statistics on Water in Mexico, 2011

From the previous analysis, it is clear that the number of overdrafted aquifers has been gradually increasing over the years; if this trend continues, in the coming years the overdrafting of aquifers will mean that in those areas in which prohibition from extracting groundwater is established, an option to obtain water resources will be the transfers of rights.

1.3.3.4 Use in agriculture

As already explained, agriculture is the greatest consumer of water, as well as being the use that represents the highest percentage of change in use in the transfers of rights. It can be observed that the volumes of water that were originally used in agriculture have been destined for industrial and public urban uses.

In Mexico there are 85 Irrigation Districts covering a total surface area of 3.48 million hectares, and 39,000 Irrigation Units covering an area of 2.98 million hectares, with a volume of 61,794 million m<sup>3</sup> of water allocated for use in agriculture.

As shown in the following table, 87% of the authorized transfers of rights were carried out in those River Basin Organizations in the north and center of the country, representing 88% of the volume allocated for the use in agriculture and covering 95% of the area of Irrigation Districts.

Authorized transfers of rights 2001-2006, volume allocated 2009 and surface area of Irrigation Districts

| River Basin Organization       | Total ATR | Percentage | Volume allocated for use in agriculture in millions of m <sup>3</sup> | Surface area in hectares |
|--------------------------------|-----------|------------|---|--------------------------|
| Lerma-Santiago-Pacific         |           |            |   |                          |
| Central Basins of the North    |           |            |   |                          |
| Northern Pacific               |           |            |   |                          |
| Rio Bravo                      |           |            |   |                          |
| Baja California Peninsula      |           |            |   |                          |
| Northern Gulf                  |           |            |   |                          |
| Northwest                      |           |            |   |                          |
| Balsas                         |           |            |   |                          |
| Waters of the Valley of Mexico |           |            |   |                          |
| Percentage of the total        |           |            |   |                          |

Source. Produced based on data from the REPDA and Statistics on Water in Mexico, 2011

As can be appreciated, the use of water in agriculture has had a relevant role in the transfers of rights, since both the volume of water allocated and the agricultural area represent important factors in these transfers. In particular the Lerma-Santiago-Pacific and Northern Pacific River Basin Organizations together represent 36% of the volume and 37% of the surface area; as a result, these areas will be highly susceptible for transfers of rights for the use in agriculture to be carried out, to meet the needs of other uses.

#### 1.3.3.5 Drinking water coverage

The population has represented a decisive factor in the reduction of the availability of water; in the future, the increase in the number of inhabitants and the targets established to increase the drinking water coverage will have an impact on the demand for the resource, since greater volumes of water will be required for domestic use. For 2005, it was observed that 88% of the authorized transfers took place in the River Basin Organizations with drinking water coverage lower than 95%.

Authorized transfers of rights, 2001-2006 and drinking water coverage, 2005

River Basin Organization  
Total ATR  
Percentage  
% drinking water coverage

Southern Pacific  
Southern Border  
Central Gulf  
Northern Gulf  
Balsas  
Northern Pacific  
Baja California Peninsula  
Central Basins of the North  
Lerma-Santiago-Pacific  
Yucatan Peninsula  
Northwest

Accumulated percentage

Source. Produced based on data from the REPDA and Statistics on Water in Mexico, 2011

In this sense, the increases in coverage will entail a greater demand for water and in those areas where the resource is scarce, greater competition will exist, meaning that the transfers of rights can be an option to obtain this vital liquid.

#### 1.3.3.6 Surface water quality

Water quality is a factor that defines the use that the resource can be destined for.

There are mainly three parameters that are used to measure surface water quality: 5-day Biochemical Oxygen Demand (BOD<sub>5</sub>); Chemical Oxygen Demand (COD) and Total Suspended Solids (TSS); the former two are indicative of organic matter and in the latter case, high levels of TSS cause a water body to lose its capacity to support aquatic life.

According to the following table, 73% of the authorized transfers of rights were in the areas where there are water bodies with a classification of heavily polluted for BOD<sub>5</sub>, COD and TSS.

Water quality is an element that is closely related with the trends in the transfers of rights, since there may be regions where there is water but it is not feasible to use it because of its state of pollution, meaning that the transfers of rights becomes an option to obtain water with the quality required.

Authorized transfers of rights, 2001-2006 in regions with heavily polluted water bodies, 2009

River Basin Organization

Total ATR

Percentage

Number of water bodies with monitoring sites classified as heavily polluted for BOD<sub>5</sub>, COD and/or TSS, 2009

Waters of the Valley of Mexico

Lerma-Santiago-Pacific

Balsas

Central Gulf

Baja California Peninsula

Northwest

Northern Gulf

Southern Border

Central Basins of the North

Accumulated percentage

Source. Produced based on data from the REPDA and Statistics on Water in Mexico, 2011

#### 1.3.3.7 Droughts

Droughts as an aspect associated with the scarcity of the resource constitute a factor that increases the demand for water, and occur most recurrently in the arid and semiarid areas of Mexico, mainly affecting the Lerma-Santiago-Pacific, Central Basins of the North, Northern Pacific, Rio Bravo, Baja California Peninsula, Balsas and Northwest River Basin Organizations, in which 79% of the authorized transfers of rights takes place.

Authorized transfers of rights in regions affected by droughts, 2001-2006

River Basin Organization

Total ATR

Percentage

Lerma-Santiago-Pacific

Central Basins of the North  
Northern Pacific  
Rio Bravo  
Baja California Peninsula  
Northwest  
Balsas  
Percentage

Source. Produced based on data from the REPDA and Statistics on Water in Mexico, 2011

In this way, it is considered that in areas where drought exists, there will be a greater demand for transfers of rights, due to the competition for the resource.

As a result of the analysis of the aforementioned factors, it becomes clear that the problems related with water resources are tending to be more noticeable and increasingly severe, especially in the northern and central regions of the country where various characteristics combine, since it is there that there is least availability of the resource (32%); the majority of the population can be found (77%); the greatest agricultural and industrial activity is carried out (78% of the GDP); there is a strong degree of water stress and furthermore, for the period 2001-2006, 87% of the authorized transfers of rights took place.

Comparison between regional development, availability of water and authorized transfers of rights by River Basin Organization

Northwest  
Rio Bravo  
Central Basins of the North  
Northern Gulf  
Central Gulf  
Yucatan Peninsula  
Southern Border  
Southern Pacific  
Balsas  
Waters of the Valley of Mexico  
Lerma-Santiago-Pacific  
Northern Pacific  
Baja California Peninsula

Mean natural availability (2010)  
Population (2009)  
GDP (2008)  
ATR (2001-2006)

Mean natural per capita availability of water (2010)

North, Center and Northwest

1 727 m<sup>3</sup>/inhabitant/year

Southeast

12 923 m<sup>3</sup>/inhabitant/year

National average

4 263 m<sup>3</sup>/inhabitant/year

Source: Produced based on the cartography of the Office for Geographic Information on Water (SIGA), with data from the REPDA and Statistics on Water in Mexico, 2011

#### 1.3.4 Hydrological-administrative regions eligible for the creation of Water Banks

From the aforementioned analysis, some factors were identified that are closely related with the transfers of rights, such as: the availability of water, the overdrafting of aquifers, the increase in population, as well as the growing demand for domestic and industrial uses, among others.

According to the trends observed in this period, it is considered that these factors will continue to have an impact on the demand for transfers in the future, hence what follows is a proposal for a weighting of these factors, in order to obtain a numerical value that represents the “Future Demand for the Transfer of Rights”, classifying the River Basin Organizations according to the number of transfers of rights and their relationship with the factors mentioned above, in order to be able to identify where there will be a greater number of transfers in the coming years.

The “Future Demand for the Transfer of Rights” is made up as follows:

$$D = RT + PA + As + Vw + GDP$$

Where:

RT = Requests for the transfer of rights. A numerical value calculated based on the number of requests for transfer of rights. A higher value means that more requests are presented.

River Basin Organization

Number of requests for transfers 2001 2006

RT

I Baja California Peninsula

II Northwest

III Northern Pacific

IV Balsas

V Southern Pacific

VI Rio Bravo

VII Central Basins of the North

VIII Lerma-Santiago-Pacific  
IX Northern Gulf  
X Central Gulf  
XI Southern Border  
XII Yucatan Peninsula  
XIII Waters of the Valley of Mexico  
Total

Source. Produced based on data from the Procedure Follow-up and Control System (SECTRA)

PA = Per capita availability of water. A numerical value determined based on the per capita availability of water, estimated for 2030. A higher value means that there will be more demand for transfers; meaning that lower availability is higher demand.

River Basin Organization  
Per capita availability of water in 2030 (m<sup>3</sup>/inhabitant/year)  
PA

I Baja California Peninsula  
II Northwest  
III Northern Pacific  
IV Balsas  
V Southern Pacific  
VI Rio Bravo  
VII Central Basins of the North  
VIII Lerma-Santiago-Pacific  
IX Northern Gulf  
X Central Gulf  
XI Southern Border  
XII Yucatan Peninsula  
XIII Waters of the Valley of Mexico  
National availability

Source. Produced based on data from Statistics on Water in Mexico, 2011

Oa = Overdrafted aquifers. A numerical value established based on the number of overdrafted aquifers. A higher value means that more transfers of rights are estimated.

River Basin Organization  
Number of overdrafted aquifers in 2009  
Oa

I Baja California Peninsula  
II Northwest

III Northern Pacific  
IV Balsas  
V Southern Pacific  
VI Rio Bravo  
VII Central Basins of the North  
VIII Lerma-Santiago-Pacific  
IX Northern Gulf  
X Central Gulf  
XI Southern Border  
XII Yucatan Peninsula  
XIII Waters of the Valley of Mexico  
Total

Source. Produced based on data from Statistics on Water in Mexico, 2011

Note: For equal figures regarding the number of overdrafted aquifers, the same index value was assigned

Vw = Volume of water allocated for use in agriculture. A numerical value determined based on the volume of water allocated for use in agriculture. A higher value means that it is estimated that there is higher demand for the transfers of rights.

River Basin Organization

Volume allocated for use in agriculture, in millions of m<sup>3</sup>

Vw

I Baja California Peninsula  
II Northwest  
III Northern Pacific  
IV Balsas  
V Southern Pacific  
VI Rio Bravo  
VII Central Basins of the North  
VIII Lerma-Santiago-Pacific  
IX Northern Gulf  
X Central Gulf  
XI Southern Border  
XII Yucatan Peninsula  
XIII Waters of the Valley of Mexico  
Total

Source. Produced based on data from Statistics on Water in Mexico, 2011

GDP = Percentage of the Gross Domestic Product. A numerical value established based on the percentage of GDP. A higher value means that it is estimated that there are more transfers of rights.

River Basin Organization  
% of the national GDP for 2008  
GDP

I Baja California Peninsula  
II Northwest  
III Northern Pacific  
IV Balsas  
V Southern Pacific  
VI Rio Bravo  
VII Central Basins of the North  
VIII Lerma-Santiago-Pacific  
IX Northern Gulf  
X Central Gulf  
XI Southern Border  
XII Yucatan Peninsula  
XIII Waters of the Valley of Mexico  
Total

Source. Produced based on data from Statistics on Water in Mexico, 2011

Note: For equal figures regarding the percentage of contribution to GDP, the same index value was assigned

The sum of the values of the different factors adds up to the “future demand for the transfer of rights” by River Basin Organization, where a greater value means that it is estimated that there is a greater demand for transfers.

River Basin Organization  
RT  
PA  
Oa  
Vw  
GDP  
D

I Baja California Peninsula  
II Northwest  
III Northern Pacific  
IV Balsas

V Southern Pacific  
VI Rio Bravo  
VII Central Basins of the North  
VIII Lerma-Santiago-Pacific  
IX Northern Gulf  
X Central Gulf  
XI Southern Border  
XII Yucatan Peninsula  
XIII Waters of the Valley of Mexico

Future demand for the transfers of rights by River Basin Organization

Northwest  
Rio Bravo  
Central Basins of the North  
Northern Gulf  
Waters of the Valley of Mexico  
Central Gulf  
Yucatan Peninsula  
Southern Border  
Southern Pacific  
Balsas  
Lerma – Santiago - Pacific  
Northern Pacific  
Baja California Peninsula

Ranges

40 (high)

Between 30 and 39 (medium)

< 30 (low)

Source: Produced based on the cartography of the Office for Geographic Information on Water (SIGA), with data from the REPGA and Statistics on Water in Mexico, 2011

The geographical distribution of the values of the “future demand for the transfers of rights” by River Basin Organization is shown in the previous graph.

According to the aforementioned, the River Basin Organizations that obtained the highest values and that appear repeatedly among the first 3 places in the different factors that make up the future demand are:

Particular indices

Ranking

1<sup>st</sup> place

2<sup>nd</sup> place

3<sup>rd</sup> place

Requests for the transfer of rights

Lerma-Santiago-Pacific

Central Basins of the North

Rio Bravo

Per capita availability of water

Waters of the Valley of Mexico

Baja California Peninsula

Rio Bravo

Overdrafted aquifers

Lerma-Santiago-Pacific

Central Basins of the North

Rio Bravo

Volume of water allocated for irrigation

Lerma-Santiago-Pacific

Northern Pacific

Rio Bravo

Percentage of the Gross Domestic Product

Waters of the Valley of Mexico

Rio Bravo

Lerma-Santiago-Pacific

According to the trends in the transfers of rights and the results obtained from their association with the previously mentioned elements of water policy, the River Basin Organizations eligible for the creation of the first Water Bank in Mexico were:

- Lerma Santiago Pacific
- Rio Bravo
- Waters of the Valley of Mexico
- Baja California Peninsula
- Central Basins of the North

Additionally, there is also a similarity in the behavior of these River Basin Organizations, since the greatest dynamism has been observed in them, both regarding the volume of water transferred and the number of transfers registered.

Thus it is in the River Basin Organizations located in the north and center of the country in which Water Banks were installed as a first priority, in order to contribute to regulating the market of rights and contribute to outlining the existing problem regarding the transfer of rights.

## 2. Experience in the regulation of water right markets

### 2.1 International practice

#### 2.1.1 The case of Chile

The total freedom of access to the creation and free transfer of water rights, jointly or separately from land, was consecrated in the 1981 Water Code, which allowed the holders of water rights the free use and destination of these resources in order to promote the efficient use of the resource, demanding the respect of characteristics of the right, such as its unique limitation.

However the Water Code, similarly to the Civil Code, declares that water resources are assets for public use, which belong to the nation and whose use is a right of any inhabitant of the nation who is granted a permanent right of use on these water resources, as a real right, in such a way that the right, as indicated in the Constitution, once granted is protected as private property.

According to Carl J. Bauer in his book *"Canto de sirenas. El derecho de aguas chileno como modelo para reformas internacionales"*, the 1981 Water Code strengthened private property rights, increased private autonomy in the use of water resources and favored free water rights markets, in such a way that the authority of the General Water Directorate, as the governmental agency responsible for water rights, is very limited.

#### 1981 Water Code

Increase in private autonomy

Strengthening private property rights

Favoring free water rights markets

According to the regulations in the Code, the General Water Directorate should grant all requests for new water rights, free of charge, provided the water is physically and legally available, without the need for any justification for the use for which it is intended, based on which the authority has no legal power to deny requests that are presented to it.

The problems that are faced in practice regarding water rights are not resolved by the authority, but by ordinary civil justice tribunals, which once the rights have been constituted, are protected by private and not public law.

According to Carl J. Bauer, we can state that the elements that characterize water rights in Chilean legislation are:

- Their owners do not pay taxes or rates of any type, be it for acquiring new rights from the government or for maintaining their rights over time;

- They have no obligation to use their water rights, as a result of which there is no fine or cancellation should that be the case; and,
- They can freely exchange the rights without any intervention from the authority

Additionally, Guillermo Donoso Harris in his book *“Mercados de Agua: Estudio del caso del Código Civil de Chile de 1981”*, comments that by considering water as an economic good, the price of scarcity is able to be internalized, in such a way as to encourage users to weigh up the opportunity cost of holding water rights, to stimulate a faster adjustment in the assignation of water between different uses, reduce the conflicts over changes of use, save global investment in new infrastructure, reduce the public investment and the pressure on new sources of water.

However, the author recognizes the existence of precedents that would seem to indicate that water markets are inefficient due to the limited number of transactions, considering among the main causes:

- a) Transfers are carried out with existing infrastructure (rigid)
- b) The concentration in space of hydrological offer
- c) The lack of reservoirs that could store water and thus reduce its delivery
- d) The registry system for the enrolment and updating of deeds is disperse and poorly coordinated
- e) A lack of knowledge on the available offer of the resource

It is therefore the case that the functioning of the rights market depends on the legal, institutional and political conditions, meaning that the design and implementation of a system of tradable rights of use should be created and those administrative, legal and normative institutions that favor the performance of markets should be strengthened, in particular regarding the registration of existing water rights, which provides transparency to the water market, a situation that according to Muchnik, Luraschi and Maldini, in their publication titled *“Comercialización de los derechos de aguas en Chile”*, has been particularly vulnerable in the Chilean system.

Based on this analysis, it can be concluded that the system of water rights in Chile, despite having legal elements that allow water resources to be freely traded, does not duly regulate these rights, as a result of the water authority being limited by the private nature by which water rights are recognized, as well as these rights being granted for perpetuity, with a free deed and without there being any obligation to use them.

The case of Mexico differs from that of Chile since as well as having a single authority in charge of the nation’s water resources, it has a Public Registry of Rights as an instrument to ascertain the status of water rights, information which, added to the availability agreements on the nation’s water resources, constitute fundamental elements that make it possible to develop an information system that fosters the definition of a rights market.

Mexico

Has a single authority regarding the nation's water resources and a Public Registry of Rights  
Water has elements that determine its value

Chile

Has an authority with limited attributions regarding the nation's water resources and a registry system of enrolment and updating of deeds that is disperse and poorly coordinated  
Water has no value recognized by the State

Water rights in Chile are immersed in a 'market' debate under a context in which the need to recognize the economic value of water responds to the fact that water in Chile is free, meaning that it has no value recognized by the State, and as such there is no parameter that estimates its value, and therefore that of the rights that are constituted in the hands of private individuals, neither in conditions of scarcity of the resources nor the transferability of the rights.

This is in contrast with the case of Mexico, firstly because water rights are the origin of the contributions foreseen in the fiscal legislation according to the uses and availability zones, in such a way that elements are available that allow the value of water to be determined, which does not occur in Chile; and secondly because the Mexican legal system, when conceptualizing the figure of Water Banks, does not attempt to freely regulate water rights as property rights on which private individuals may impose a price, but rather its fundamental objective is to promote the more efficient assignation of the resource.

### 2.1.2 The case of Spain

Water markets in Spain were introduced by the "46/1999 Law, from December 13, which modified the 29/1985 Law, from August 2, on Waters", in which the limitations of traditional policies were recognized along with the need for greater flexibility of the concessions regime, thus introducing the possibility to temporarily and voluntarily exchange water concessions, be it through direct negotiation between owners of concessions formalized as a cession contract, or through "Exchange Centers" or "Public Water Banks", in both cases it being necessary for the River Basin Organization to give its approval and to guarantee that the rights of third parties are protected.

Currently, the "Royal Legislative Decree 1/2001, from July 20, through which the revised Water Law is approved", establishes the guiding rules of these figures.

In this sense, the right cession contract is subject to the following:

- It can be carried out between dealers or holders of some right to the exclusive use of the water resources, subject to administrative authorization
- It should be temporary and respect the precedence of uses established by Law
- The volume that may be ceded should in no case be above that really used by the grantor
- The flows that can be ceded will be taken into consideration as being effectively used in the concession in order to avoid the possible expiry of the grantor's concessional deed

- The cession of water rights might entail an economic compensation that will be mutually established between the contracting parties and should be made explicit in the contract
- Those acquiring the rights derived from the cession will assume the grantor's obligations
- The cession should be formalized in writing and be made known to the River Basin Organization and to the communities of users that the grantor and the grantee belong to

In accordance with the aforementioned requirements, the River Basin Organization may decide not to authorize the cession of rights for the use of water, if that resolution would negatively affect the regime of use of the resources in the catchment, the rights of third parties, the environmental flows, the status of conservation of the aquatic ecosystems or, if some of the aforementioned requirements are breached, it will be a cause for expiry of the grantor's concessional right.

Once rights cession contracts are authorized for the use of water, they should be registered in the Water Registry.

It should be mentioned that the Spanish legislation foresees that the River Basin Organization can exercise a preferential right of acquisition on the use of the flows that are ceded, thus recovering the flows from any exclusive use.

Notwithstanding this fact, as explained by Javier Calatrava Leyva in his book "*Mercados y Bancos de Agua en España*", informal exchanges of water in Spain are very common, with cessions limited to a local scope dominating, meaning agreements between users of a same community, in which case these exchanges mainly correspond to private rights on groundwater, the owners of which carry out the purchase and sale with individual irrigators, communities of irrigators or urban supply companies, or exchange them for irrigation turns or loans of machinery without any monetary transaction taking place.

In accordance with the code we have referred to, Right Exchange Centers are characterized as:

- Being created in exceptional situations as a result of an Agreement of the Catchment Ministerial Council at the proposal of the Environment Minister
- Authorizing the River Basin Organizations to carry out public acquirement offers of the rights to use the water, to cede them at a later date to other users through the price that the Organization itself offers
- The purchase and sale system of water rights will be subject to the principles of publicity and free competition
- The accountability and registration of the operations carried out through the Exchange Center will be managed separately from the other acts in which the River Basin Organizations might take part.

In this context, in June 2004, the Environment Ministry drew up a program for water management called "A.G.U.A." in Spanish or "Actions for the Management and Use of Water", among the objectives of which is to create in each catchment a Public Water Bank that allows

historical rights to be reassigned with criteria of equity, efficiency and sustainability, with the aim of minimizing the effects of drought in areas where water resources are overdrafted.

That same year, the Public Water Bank in the Segura catchment commenced, in whose drought protocol the Environment Ministry foresaw the possibility of activating Water Banks and markets.

However, the lack of regulation in exchanges between catchments represented barriers in practice, so through the “Royal Decree of Law 15/2005, from December 16, on urgent measures for the regulation of transactions of rights for the use of water”, it was allowed to attend to drought conditions by selling water between those interconnected catchments, particularly between the Segura and the Tajo through the Tajo-Segura Aqueduct and between the headwaters of the Guadalquivir and the catchment of the Almanzora river.

Based on the study of the experience of Spain, it may be concluded that there are few similarities or schemes that might be adopted for the case of Mexico, as expressed by the following considerations.

- Although it is true that cession contracts in Spain have similarities with the transfer of rights foreseen by Mexican legislation, since they establish the possibility of the holders of water rights transferring them to a third party, they differ regarding the temporality of transfers and in that they are carried out between uses of the same or a higher range according to the precedence of uses established by Law
- Scarcity conditions and the availability of the resource in Spain have highlighted the need to have infrastructure that facilitates the transfer of rights between different catchments, which has led to the famous “inter-basin transfers”, a situation that in the case of Mexico represents a major challenge if the existing limitations are considered regarding the infrastructure and geographical location of the regions with the greatest availability in contrast with those where it is lower.

### 2.1.3 The case of the United States of America

Water Banks emerged in the United States of America (USA) as a water resources management tool. They are defined as an institutional mechanism that facilitates the legal exchange and transfer of water. In general terms, Water Banks act as an intermediary between buyers and sellers, providing them with administrative and technical services. There are variations of these figures, such as “Information Centers”, with data from buyers and sellers; or market drivers, which aim to generate a balance between those who offer water and those who are seeking it, identifying their mutual interests.

Some of the functions of Water Banks in that country are:

- To determine the rights that can be transferred
- To establish the quantity of water that can be transferred

- To identify the stakeholders that may take part in the transactions to buy/lease/sell in the Bank
- To establish the terms of contracts and prices

In the USA, Water Banks emerged from the need to provide water to users in those areas where it is in short supply. There are basically three types of Banks:

- a) Institutional, which provide legal mechanisms for the exchange of rights
- b) Of surface water, developed around a reservoir or various storage systems
- c) Of groundwater, working mainly as physical storage; water is injected so that it filters down and can be used when the surface water is scarce

Furthermore, in some states “Recovery” or “Emerging Programs” have been created for specific needs.

The market structure determines to a large extent the activity of Water Banks; most commonly in the USA, the price will be determined by the market as a result of negotiations between buyers and sellers, through “Information Centers”.

In order to measure the activity of Water Banks, four categories are defined, according to the yearly number of transactions:

- None: No transactions
- Limited: Less than 5
- Moderate: Between 5 and 10
- High: More than 10

To find out more about how Water Banks operate and have operated in the USA, what follows is a reference to the specific cases of 12 states from the west of the American Union:

Arizona  
Montana  
Texas  
California  
Nevada  
Utah  
Colorado  
New Mexico  
Washington  
Idaho  
Oregon  
Wyoming

It should be mentioned that in the USA, there is no national Water Law as is the case in Mexico. In general terms, in all cases shown in the following pages, surface and groundwater are considered public and are regulated by state or different municipal laws, applicable in the corresponding geographical scope.

#### 2.1.3.1 Arizona

It is worth mentioning that Water Banks were not created to boost the water market, but rather to prevent drought-related contingencies.

Name / Type of Bank: Arizona Water Banking Authority / Groundwater

Year of creation: 1996

Starting year of the activity: 1997

Objective: Store in the aquifer the excess surface water from the Central Arizona Project (CAP), in order to transfer it to the Department of Water Resources or the Water Conservation District and deliver it to the CAP's users when facing drought conditions

Administrator: Arizona Water Banking Authority

Price: Determined annually by the CAP and fluctuates between 21 and 53 USD per acre-foot

Activity: High

Water Banks in United States of America

Arizona

California

Colorado

Idaho

Montana

Nevada

New Mexico

Oregon

Texas

Utah

Washington

Wyoming

#### 2.1.3.2 California

A) Name / Type of Bank: Drought Water Bank / Emerging Program

Year of creation: 1991

Starting year of the activity: 1991 - 1994

Objective: "Emerging" Banks in which rights are bought in the northern part, to meet critical water needs in the south, caused by droughts

Administrator: California Department of Water Resources

Price: Baseline established that fluctuates between 68 and 175 USD per acre-foot

Activity: High

B) Name / Type of Bank: Water Bank for dry years / Emerging Program

Year of creation: 2001

Starting year of the activity: 2001 - 2003

Objective: Operate when hydrological conditions are outside the ranges considered normal

Administrator: California Department of Water Resources

Price: Baseline established that fluctuates between 75 and 100 USD per acre-foot

Activity: High

C) Name / Type of Bank: Semitropic Groundwater Storage Program / Groundwater

Year of creation: 1990

Starting year of the activity: 1991

Objective: For irrigators to store part of the water from wet years in the aquifer, in order to be used in dry years

Administrator: Semitropic Improvement District

Price: The price is based on annual operations

Activity: Moderate

#### 2.1.3.3 Colorado

Name / Type of Bank: Arkansas River Basin Water Bank Pilot / Institutional

Year of creation: 2001

Starting year of the activity: 2003

Objective: To function as an "Exchange Center", through a website

Administrator: Southeast Colorado Water Conservation District

Price: It was established by the sellers and fluctuated between 500 and 1,000 USD per acre-foot

Activity: None

No operation was finalized, since the buyers considered that the prices defined by the sellers were very high.

#### 2.1.3.4 Idaho

A) Name / Type of Bank: Idaho Water Supply Bank / Institutional

Year of creation: 1979

Starting year of the activity: 1995

Objective: Stimulate the more beneficial use of water, as well as obtaining resources to improve the infrastructure and raise efficiencies. It operates under the rule of "first in, first out", meaning that the priority is not according to the price, but rather the seniority

Administrator: Idaho Department of Water Resources

Price: A price was established based on 11 USD per acre-foot

Activity: Moderate

B) Name / Type of Bank: Water Bank in Irrigation Districts (5) / Surface water

Year of creation: 1979, 1988, 1990, 1999 and 2001

Starting year of the activity: 1979, 1988, 1990, 1999 and 2001

Objective: Increase the flow of water in the catchment; they were established as “Exchange Centers”, in which water rights are leased

Administrator: Irrigation District 1, 63, 65, 65K and 74

Price: Established by the Districts and varies between 3 and 7 USD per acre-foot, with the exception of ID 74, where the price is 146 USD

Activity: Moderate and High

#### 2.1.3.5 Montana

In this state there are no Water Banks, however there is a market that operates through the “leasing” of water, in order to maintain streams of water to benefit fishing.

#### 2.1.3.6 Nevada

A) Name / Type of Bank: Interstate Water Bank / Surface water

Year of creation: 2002

Starting year of the activity: 2002

Objective: Transfer excess volumes of water from the Colorado River to the state of Nevada

Administrator: Southern Nevada Water Authority, Arizona Water Banking Authority and Central Arizona Water Conservation District

Price: 78 USD per acre-foot

Activity: Limited

B) Name / Type of Bank: “Truckee Meadows” Groundwater Bank / Groundwater

Year of creation: 2000

Starting year of the activity: 2000

Objective: Register the volume extracted and compare it with the recharge, in order to identify when there is a deficit

Administrator: “Truckee Meadows” Water Authority

Price: Not applicable

Activity: None

Strictly speaking, in the “Truckee Meadows” Groundwater Bank there is no activity related to the transfer of rights.

#### 2.1.3.7 New Mexico

Name / Type of Bank: Pecos River Water Rights Lease / Purchase Program / Institutional

Year of creation: 1991

Starting year of the activity: 1992

Objective: Carry out the permanent purchase of rights or their annual leasing to meet New Mexico’s commitments with Texas

Administrator: Interstate Stream Commission (ISC)

Price: Established based on negotiations between the ISC and the Carlsbad Irrigation District and has fluctuated between 50 and 100 USD per acre-foot

Activity: Moderate

Additionally, in 2002 the establishment of Water Banks started for the Pecos River Basin, in order to increase its flow, through temporary transfers, to protect the habitat of certain species.

#### 2.1.3.8 Oregon

A) Name / Type of Bank: Deschutes Groundwater Mitigation Bank / Groundwater

Year of creation: 2003

Starting year of the activity: 2003

Objective: Mitigate the impact of the extraction of groundwater from the Deschutes river basin

Administrator: Deschutes River Conservancy and Deschutes Water Exchange

Price: 95 USD per acre-foot

Activity: Limited

B) Name / Type of Bank: Walla Walla Lease Program / Recovery Program

Year of creation: 2001

Starting year of the activity: 2001

Objective: Protect the habitat of species in Umatilla County, where the Oregon Water Trust leases rights to the Irrigation District on an annual basis

Administrator: Water Oregon Trust

Price: Fluctuates between 15 and 19 USD per acre-foot

Activity: Moderate to low

Furthermore, the US Bureau of Reclamation has various water leasing programs in Oregon. For example, in 2001, the Program for Reducing Irrigation Water Use commenced, with the objective of protecting species upstream in the Klamath River. Additionally, in 2003 a leasing program was established, for crop idling and replacement of groundwater, in order to increase the flow of water in the Klamath river basin, for the states of Oregon and California.

#### 2.1.3.9 Texas

Name / Type of Bank: Texas Water Bank / Institutional

Year of creation: 1993

Starting year of the activity: 1994

Objective: Acting as an "Exchange Center" through a web page

Administrator: Texas Water Development Board

Price: Established through negotiations between buyers and sellers

Activity: Limited

It is worth mentioning that in a period of 10 years, only one operation has been carried out; its inactivity is the result of various factors such as the lack of knowledge on the existence of Water Banks; an inadequate regulation of groundwater; cancellation of statutory water rights; furthermore, the presence of managers who compete with the activities of the Bank, carrying out their own operations.

#### 2.1.3.10 Utah

The state has no Water Banks; however, it has specific statutes that regulate the transfer of water rights, which may be the basis for the establishment of Water Banks.

#### 2.1.3.11 Washington

A) Name/Type of Bank: Salmon Creek Water Leasing Bank / Recovery Program

Year of creation: 2000

Starting year of the activity: 2000

Objective: To increase the flow of water in the streams of Salmon Creek, in order to conserve the population of the Chinook Indians, where the Washington Water Trust buys temporary rights from the Okanogan Irrigation District

Administrator: Washington Water Trust, Federation of Tribes of Colville and Okanogan Irrigation District

Price: Has varied from 45 to 58 USD per acre-foot

Activity: Moderate to high

B) Name/Type of Bank: Yakima Basin Temporary Water Transfer Program / Emerging Program

Year of creation: 2001

Starting year of the activity: 2001

Objective: It was created in an emerging way to reduce the effects of drought

Administrator: Special Committee

Price: It reached 495 USD per acre-foot, in the most critical moments of the drought

Activity: High

#### 2.1.3.12 Wyoming

In this state there are no Water Banks, however around 1950, agricultural users were allowed to temporarily transfer water (for up to two years), with the aim of having additional water for the construction of highways and railroads.

What follows is a summary table with the main characteristics of the Water Banks of the twelve states of the American Union mentioned on the previous pages.

State

Creation / Start

Name / Type of Bank

Objective

Price (USD)

Activity

Arizona

1996/1997

Arizona Water Banking Authority / Groundwater

Store the excess surface water in the aquifer, in order to use it when drought conditions occur

21-53

High

California  
1991/1991-1994  
Drought Water Banks / Emerging Program  
Emerging bank to meet critical water needs caused by droughts  
68-175  
High

California  
2001/2001-2003  
Water Bank for dry years / Emerging Program  
Operate when hydrological conditions are abnormal  
75-100  
High

California  
1990/1991  
Semitropic Groundwater Storage Program / Groundwater  
To store water from wet years in the aquifer, in order to be used in dry years  
Variable  
Moderate

Colorado  
2001/2003  
Arkansas River Basin Water Bank Pilot / Institutional  
Website that functioned as an "Exchange Center"  
500 – 1,000  
None

Idaho  
1979/1995  
Idaho Water Supply Bank / Institutional  
Stimulate the more beneficial use of water as well as obtaining resources to improve  
infrastructure and raise efficiencies  
11  
Moderate

Idaho  
1979 to 2001/ 1979 to 2001  
Water Banks in Irrigation Districts (5) / Surface water  
Increase the flow of water in the catchment  
3 – 7  
146 (DR 74)  
Moderate and high

Nevada  
2002/2002  
Interstate Water Bank / Surface water  
Transfer excess volumes of water from the Colorado River to the state of Nevada  
78  
Limited

Nevada  
2000/2000  
Truckee Meadows Groundwater Bank / Groundwater  
Register the volume extracted and compare it with the recharge, in order to identify deficits  
Not applicable  
None

New Mexico  
1991/1992  
Pecos River Water Rights Lease/Purchase Program / Institutional  
Purchase or lease rights for New Mexico's commitments with Texas  
50 – 100  
Moderate

Oregon  
2003/2003  
Deschutes Groundwater Mitigation Bank / Groundwater  
Mitigate the impact of the extraction of groundwater from the Deschutes river basin  
95  
Limited

Oregon  
2001/2001  
Walla Walla Lease Bank / Recovery Program  
Protect the habitat of species in Umatilla County  
15 – 19  
Moderate to low

Texas  
1993/1994  
Texas Water Bank / Institutional  
Acting as an "Exchange Center"  
Variable  
Limited

Washington

2000/2000

Salmon Creek Water Leasing Bank / Recovery Program

To increase the flow of water to the streams of Salmon Creek in order to conserve the population of the Chinook Indians

45 – 58

Moderate to high

Washington

2001/2001

Yakima Basin Temporary Water Transfer / Emerging Program

Reduce the effects of drought

Up to 495

High

As may be observed in the aforementioned cases, Water Banks in the USA have been created for diverse purposes, among which is attending to extreme conditions, such as droughts; maintaining environmental flows for the protection of certain species, and even the conservation of ethnic groups such as in the case of Washington; or even to meet delivery commitments with volumes of water between two or more States, such as the Water Banks in Nevada and New Mexico.

An aspect that it is worth mentioning related to some Water Banks in the USA is that on occasions they are considered as physical storage, meaning that water is injected into aquifers in order to be able to use it at a later date.

Also worth underlining is that various Water Banks in the USA operate as “Exchange Centers”, in which the prices are negotiated between buyers and sellers through the market. Although one example is worth emphasizing, the Arkansas Water Bank Pilot, in the State of Colorado, which did not manage to finalize any operation because the prices established by the sellers were too high. Similarly, the Texas Water Bank is particularly remarkable since in 10 years, only one operation was finalized.

The activity that Water Banks might have depends to a large extent on the form in which it operates and the rules that are established. For example, of the cases presented in this section, there are Water Banks in which temporary transfers are allowed, in which it is common that the State purchases water rights from agricultural users in Irrigation Districts, in order to attend to certain specific needs, which allows a high level of activity.

Although Water Banks have increased over time in the USA, the number of transactions and the volume of water transferred have not increased significantly. They are occasionally a highly efficient response to concrete needs and on other occasions their implementation does not really trigger market activity.

According to the experience observed in Water Banks in the USA, it is considered that for Water Banks in Mexico, the following aspects have particular significance:

a) The legal nature should be aligned with the laws and regulations, proposing the changes considered necessary to secure a high level of activity

b) The objectives and functions of Water Banks should be clear and understandable; they should be broadly communicated in order for the Banks to become trustworthy bodies for the users

The necessary institutional mechanisms should be established, so that in practice there is a market of rights between sellers and buyers, in which the transfers of rights can be carried out.

### 3. Legal elements for the creation of Water Banks in Mexico

#### 3.1 National Water Law

The Decree through which various dispositions of the National Water Law were reformed, added and repealed, published in the Official Government Gazette on April 29, 2004, introduced the figure of Water Banks to the regime of the nation's water resources.

In article 37 BIS, the National Water Law foresees the possibility of the creation of Water Banks as shown below:

*ARTICLE 37 BIS. "The Commission" may establish bodies, on a permanent or temporary basis, in which regulated operations of right transfers are managed, denominated "Water Banks," whose functions shall be determined in the corresponding regulations.*

This disposition is limited to conceptualizing Water Banks, referring their specific regulation to the terms of the By-Laws; however, at the time of going to press, the existing By-Laws that remain in effect are the version prior to the publication of the Decree that modified the National Water Law, since the new ordinance has not been published.

This situation has constituted a limiting factor for the strengthening of these bodies in Mexico, notwithstanding which, the Deputy Director General's Office for Water Administration, through the Department of Regulation of Right Transfers, Water Banks and Information Control, is working on this issue in order to comply with the targets established in the 2007-2012 National Water Program and to consolidate this figure in Mexico.

It is thus clear that the addition of article 37 BIS to the National Water Law brought with it the incorporation of the figure of Water Banks as management bodies for regulated operations of right transfers, a figure through which the water authority seeks to boost and promote integrated water resources management.

As indicated in the legal precept, for the implementation of Water Banks, the corresponding regulation should include the fundamental elements that facilitate their operation, as well as establishing their functions and the prohibitions or limitations on their operation, as appropriate, in order to safeguard them for example from interpretations of privatization, which might take them out of context, as the institutional mechanism in charge of facilitating the transfer of rights by acting as the body that brings together the buyers of these rights.

#### WATER BANKS

##### Article 37 bis

#### 3.2 Legal nature of Water Banks in Mexico

The definition of the legal nature of Water Banks is in conformity with the character of water resources as national assets subject to the regime of public ownership, in such a way that the Constitutional regime is not contravened.

As a public body, the Water Bank is entitled to provide the users with legal security to carry out the transfers of rights that allow the reassignment of those volumes of water that are not used, for them to be allocated to more efficient uses, under schemes of regulation that prevent speculation or stockpiling of the resource, or even the encumbrance of the holders' rights, in cases where temporary transfers are permitted.

Based on the aforementioned, in the following pages we refer to the public nature of the nation's water resources, in conformity with the terms of the Political Constitution of the United Mexican States and other relevant regulatory legislation.

- Political Constitution of the United Mexican States
- General Law on National Assets
- National Water Law

Article 27 of the Political Constitution of the United Mexican States in its first paragraph establishes:

Ownership of the lands and waters within the boundaries of the national territory is vested originally in the Nation, which has had and continues to have the right to transfer the deeds thereof to private individuals, thereby constituting private property.

The water resources which are originally owned by the nation, as established by the first paragraph, are listed in the fifth paragraph:

In the Nation is likewise vested the ownership of the waters of the territorial seas, within the limits and terms fixed by international law; inland marine waters; those of lagoons and marshes permanently or intermittently connected with the sea; those of naturally formed inland lakes which are directly connected with constant streams; those of rivers and their direct or indirect tributaries from the point in their flow where the first permanent, intermittent, or torrential waters commence, to their mouth in the sea, or a lake, lagoon, or marshes forming a part of public property; those of constant or intermittent streams and their direct or indirect tributaries, whenever the whole or part of its course serves as a boundary of the national territory or of two states, or if it flows from one state to another or crosses the dividing line of the Republic; those of lakes, lagoons, or marshes whose basins, zones or shores are crossed by the dividing lines of two or more states or between the Republic and a neighboring country or when the shoreline serves as the boundary between two states or between the Republic and a neighboring country; those of springs that flow from beaches, maritime areas, the beds, basins, or shores of lakes, lagoons, or marshes in the national domain; and waters extracted from mines and the channels, beds, or shores of inland lakes and streams in an area fixed by law.

And, in its sixth paragraph, it indicates that those assets will be characterized as inalienable and imprescriptible, establishing for that purpose the formality through which the nation's water resources may be used, exploited or appropriated:

In the cases referred to in the previous paragraphs, ownership by the Nation is inalienable and imprescriptible, and the exploitation, use, or appropriation of the resources in question, by private persons or by companies constituted according to Mexican laws, may not be undertaken except through concessions granted by the Federal Executive Branch, in accordance with rules and conditions established by law.

Similarly, we refer to the General Law on National Assets, whose objective is to establish those goods that constitute the nation's wealth as well as the public regime that they are subjected to. That ordinance recognizes in its article 3 the waters referred to in the Constitution as national assets; and in its articles 4 and 6 it indicates that those assets will be subject to the public regime that the respective laws indicates.

Article 3. National assets are classified as:

I. Those indicated in Article 27, fourth, fifth and eighth paragraphs; (...)

"Article 4. National assets will be subject to the public regime or to the specific regulation that is indicated in the respective laws. This Law will be applied to all national assets, except those regulated by specific laws. With respect to the latter, the present Law will be applied only in parts not ruled by those specific laws and only insofar as it does not contravene the latter laws."

Article 6. The following are subject to the public regime of the Federation:

I. The assets indicated in article 27, fourth, fifth and eighth paragraphs; article 42, fraction IV, and article 132 of the Political Constitution of the United Mexican States;

Similarly to the Magna Carta, article 13 of the aforementioned ordinance recognizes the inalienable and imprescriptible nature of those assets, as well as specifying that they are indefeasible:

Article 13. The assets subject to the public regime of the Federation are inalienable, imprescriptible and indefeasible and will not be subject to actions to recover the assets or their definitive or provisional ownership, or any other type of ownership from third parties.

Based on the aforementioned legal precepts, we may clarify the following elements that act as guidelines for the legal framework related to the nation's water resources, namely:

a) They are public assets, which as assets whose ownership is originally in the hands of the nation, may only be transferred by the sovereign power of the State.

b) They are inalienable, meaning that they cannot be the object of private property, nor can they be the subject of trade; owners' deeds can therefore not be held permanently by private individuals; furthermore, they are not susceptible to be acquired due to expiry by private individuals and are not defeasible under any circumstance or regime.

c) They are imprescriptible, meaning that their legal quality or nature does not lapse over the course of time.

The nation's water resources

Inalienable

Imprescriptible

Indefeasible

Regarding the use, exploitation or appropriation of assets subject to the public regime, the General Law on National Assets ratifies the constitutional mandate, while adding that the rights that may be constituted in favor of citizens will be exclusively those formulated, and their granting will be subject to the terms of the specific laws under the formality of the act of authority named concession.

Article 15. Private individuals and public institutions will only be able to acquire the rights regulated in this Law and in the others issued by the Congress of the Union, for the use, appropriation and exploitation of the assets subjected to the Federation's public regime.

Article 16. Concessions, permits and authorizations on assets subject to the Federation's public regime do not create real rights; they simply grant the right to carry out uses, appropriations or exploitations from the administration and without prejudice to third parties, according to the rules and conditions established by the laws and corresponding concession deed, permit or authorization.

Article 17. The concessions of assets that are under the Nation's direct ownership and whose granting is authorized by the sixth paragraph of article 27 of the Political Constitution of the United Mexican States will be governed by the terms in the respective regulatory laws.

Under these considerations and protected by the National Water Law, which regulates article 27 of the Constitution, the National Water Commission, in its capacity as the authority in this area creates, under an administrative act named 'concession', an individual legal situation in the legal sphere of people, meaning a right to exploit, use or appropriate the nation's water resources, as established in its article 20:

In conformity with the public nature of water resources, the exploitation, use, or appropriation of the nation's water resources will be carried out through concession or assignation granted by the Federal Executive Branch through "the Commission" by means of the River Basin Organizations, or directly by the Commission when applicable (...).

## Concession or assignation

Article 27 of the Constitution

Article 17 of the General Law on National Assets

Article 20 of the National Water Law

The Law distinguishes between concessions and assignations, according to the subject and object of the right:

The exploitation, use, or appropriation of the nation's water resources by natural persons or legal entities will be carried out through concession granted by the Federal Executive Branch through "the Commission", by means of the River Basin Organizations, or by the Commission when applicable, according to the rules and conditions established by this Law, its By-Laws, the deed and the extensions that are issued for that purpose.

The exploitation, use, or appropriation of the nation's water resources by decentralized agencies and bodies of the federal, state or municipal public administration, or the Federal District and its decentralized bodies, will be carried out through a concession granted by the Federal Executive Branch through "the Commission" by means of the River Basin Organizations, or by the Commission when applicable, according to the rules and conditions established by this Law and its By-Laws.

Regarding the provision of water services for public urban or domestic purposes, including the processes that these services entail, the exploitation, use, or appropriation of the nation's water resources will be carried out through an assignation granted by the Federal Executive Branch through "the Commission" by means of the River Basin Organizations, or by the Commission when applicable, to municipalities, states or the Federal District, corresponding with Section VIII of Article 3 of the present Law...

Once the authority grants the concession, people acquire the right to use, exploit or appropriate the nation's water resources, highlighting among the prerogatives that are granted to the holders the one constituted regarding transfer of rights in section IV of article 28.

Article 28. Concession holders shall have the following rights:

IV. When applicable according to current regulations, transferring rights specified in the deeds they hold, in accordance to provisions of this Law;

Thus the exercising of the right to transfer the deed is dependent on the assumptions and requirements foreseen in the National Water Law and its By-Laws, based on the fact that the right has its origin in a unilateral and external manifestation of the will expressed by a decision of a competent administrative authority, exercising its public legal authority.

In this sense, the general principles that the transfer of rights are subject to are foreseen in article 33:

Article 33. Concession deeds for the exploitation, use, or appropriation of the nation's water resources that are legally in force and registered with the Public Registry of Water Rights, as well as Discharge Permits, may be transferred in full or in part based on the provisions in the present Chapter and those additional provisions stipulated in the Law and its regulations.

Concession deeds or provisional permits for the exploitation, use, or appropriation of the nation's water resources, will be subject to the following for their transfer:

I. For a change of deed holder in which the concession deed's specifications remain unchanged, the transfer shall proceed by presenting a written request to "the Water Authority" who shall determine and notify whether or not it is accepted, as well as entering it into the Public Registry of Water Rights;

II. Prior authorization by the "the Commission" shall be required when, according to the regulations of this Law, the rights of third parties may be encumbered, or there may be some alteration or modification of the hydrological or environmental conditions of the respective catchments or aquifers; "the Commission" may, depending on the circumstances, grant, deny, or instruct the terms and conditions under which the requested authorization is to be granted, and

III. Submittal to the Public Registry of Water Rights of those deeds authorized by "the Water Authority" through general agreements issued by hydrological region, catchment, state or the Federal District, zone or location; this authorization shall only be granted for the transfer of the corresponding certificates, within the same catchment or aquifer. These agreements shall be published in the Official Government Gazette.

When rights are not transferred or there are changes to the respective deed, if the concession holder intends to provisionally grant full or partial use of the water to a third party, the provisions of Article 23 BIS and the regulations of the present law shall apply.

According to the aforementioned, Article 37 expressly indicates:

ARTICLE 37. Transfers made in contravention of provisions of the present Law shall be null and void and shall produce no legal effect.

Given the aforementioned, the operation by which rights are transferred may only be carried out through public bodies, as regulators of acts of authority regarding integrated water resources management, since otherwise such operations would be associated with commercial practices which would favor the stockpiling and privatization of water.

If a different nature of the Water Bank were considered, the functions that it carries out regarding the transfer of rights could result in questioning their constitutionality and legality, particularly as regards the inalienable characteristic of the nation's water resources and the public regime they are subject to, which would limit the Bank's role to merely being an intermediary between the user and the authority for the purpose of the procedure, without any further influence on the process, since otherwise it would invade the area of competence of the administrative units of the National Water Commission and the applicable legal ordinances would be contravened.

## 4. Implementation of Water Banks in Mexico

### 4.1 Conceptualization

The Water Bank in Mexico has been conceptualized as a management body for regulated operations of right transfers, meaning as an instrument that contributes to the regulation of existing informal practices in this area, in order to create a regulated rights market, in which the efficient assignation or reassignation of the resource is promoted towards more productive uses, so as to foster the integrated and sustainable management of the resource.

Water Banks throughout time will gradually increase their operative capacity according to the requirements and results of their operation that are evaluated, as well as the computing infrastructure that facilitates the availability and management of information, which allows the Water Banks to evolve and strengthen:

Information Center  
Management Center  
Advice Center

Water Banks open up information, provide specialized advice and are facilitators of operations related to the transfers of rights.

#### 4.1.1 Mission

The mission of Water Banks is:

To be established as a management body for regulated operations of right transfers, in order to contribute to the sustainable development of water resources

#### 4.1.2 Vision

Once the mission is established, in the future Water Banks aim to:

Be a specialized body regarding the transfer of rights that provides excellent quality advice to users so as to thereby promote the establishment of a regulated market of water rights

#### 4.1.3 Objectives

The objectives established for Water Banks are:

##### Objective 1.

To provide reliable, accurate and timely information on the existing supply and demand for water in a specific region, meaning in the geographic scope of the River Basin Organization, in order to make the reassignments of water rights more efficient and to foster sustainability.

- Strategy 1.1. Act as an Information Center in which the requirements of supply and demand for water are concentrated, as a means for users to have access to elements that foster the development of the regulated water market.
- Strategy 1.2. Disseminate the supply and demand for available water through the web page of the Water Banks, as an instrument that facilitates the follow up for users on their requirement and as a means of reliable and timely information on the trends in the market of rights.
- Strategy 1.3. Develop and implement an Information System on Water Banks (Follow up System on Water Banks), in order to have the computing infrastructure necessary for the information generated through the operation of Water Banks to be used.

#### Objective 1

- Provide reliable, accurate and timely information for decision making

#### Objective 2

- Provide advice and guidance to sellers of water rights

#### Objective 2

Provide advice and guidance related with the technical and administrative aspects of the region in which the Water Bank is located, as well as the normativity applicable to the transfer of rights, in order for users to have elements for decision making and for the operations to be carried out directly with the water authority.

- Strategy 2.1. Give guidance regarding the particular technical characteristics and hydrological conditions of the region, in order to promote the more efficient reassignment of the resource in such a way as to contribute to sustainable development.
- Strategy 2.2. Provide clear advice to the user based on integrated information, which allows appropriate decisions to be taken as well as the procedures to transfer rights to be initiated in optimal conditions so that in due course the swiftness of the procedure may be benefitted.
- Strategy 2.3. Provide information related with the requirements that should be accredited in order to present the procedure to transfer rights, as well as regarding the rights and obligations derived for each of the stakeholders involved in a transfer, in order to avoid additional requirements that delay the issuing of the corresponding resolution.
- Strategy 2.4. Attend to the procedure to transfer rights in its three modalities, A, B and C, from start to finish through the Water Banks.

#### 4.2 Scopes

Water Banks are public as regards their legal nature and their implementation is initially regional in nature in the River Basin Organizations, in a geographical area in which there is a prevailing need to preserve the resource, particularly where granting new concessions is difficult, given the scarcity of the resource, meaning that their intervention contributes to counteract the informal market, and therefore, the stockpiling of the resource and related illegal practices.

Their operation is supported by the principles of transparency, security and legal certainty, which motivate users to carry out regulated rights transfer operations through the water authority.

Through this body, access to information can be guaranteed related with the supply and demand of water, providing guidance that promotes the more efficient reassignment of the resource.

At all times, Water Banks will promote the observance of the applicable normativity regarding the transfer of rights, fostering conditions under which:

- Speculation on the value of water is avoided
- The reassignment of unused allocated volumes of water is fostered, for more efficient and productive uses
- Equity in the access to water resources is promoted while the encumbrance of third parties is avoided
- Information is accessible on the availability of water in the specific hydrological-administrative region, which allows the supply and demand to be correlated
- The supply and demand for the transfer of rights submitted through it are disseminated

Water Bank

Legal nature = Public

.A body specialized in the transfer of rights

Coverage or scope of action:

.Initial = given geographical area

.Final = Regional (the territorial constituency of the River Basin Organization)

Principle = Efficiency, transparency, security and legal certainty

A promoter of normative observance

#### 4.3 Establishment of Water Banks

Water Banks, in conformity with the provisions of article 37 bis of the National Water Law, are bodies in which regulated operations of right transfers are managed.

According to the provisions of the 2007-2012 National Water Program, the target for this administration was to have two Water Banks in operation; in this sense, the first Water Bank was established in December 2008 in the Central Basins of the North River Basin Organization, and the second one was established in June 2009, in the Lerma Santiago Pacific River Basin Organization. The latter are the two regions that represent the highest number of right transfers, as well as presenting the most significant problem related with some elements of water policy, among which the availability of water, degree of water stress and overdrafted aquifers are worth mentioning.

Considering that Water Banks are important water resources management tools, the need and interest were determined for the extension of the scheme, to cover the rest of the River Basin

Organizations into which the hydrological-administrative regions of the National Water Commission are divided. As a result, Water Banks continued to be established in 2009, coming to a close in November 2010 with the coverage of the 13 River Basin Organizations, as described in the following table.

Water Bank  
Establishment

Central Basins of the North December 2008  
Lerma Santiago Pacific June 2009  
Rio Bravo September 2009  
Northern Pacific November 2009  
Balsas December 2009  
Baja California Peninsula December 2009  
Central Gulf August 2010  
Southern Pacific August 2010  
Southern Border October 2010  
Waters of the Valley of Mexico October 2010  
Northwest November 2010  
Yucatan Peninsula November 2010  
Northern Gulf November 2010

Water Banks established in River Basin Organizations:

- I. Baja California Peninsula
- II. Northwest
- III. Northern Pacific
- IV. Balsas
- V. Southern Pacific
- VI. Rio Bravo
- VII. Central Basins of the North
- VIII. Lerma Santiago Pacific
- IX. Northern Gulf
- X. Central Gulf
- XI. Southern Border
- XII. Yucatan Peninsula
- XIII. Waters of the Valley of Mexico

At a later date, with the aim of complementing the national coverage, the decision was made to implement a similar scheme in the Local Offices through what have been called support offices for Water Banks, starting with those with the highest percentage of transfers, in such a way that in December 2010 operations commenced in the support offices in Zacatecas, Chihuahua and Guanajuato, which in essence carry out the same functions as the Water Banks.

Support offices for Water Banks established in local offices:

- Chihuahua Local Office
- Zacatecas Local Office
- Guanajuato Local Office

It is important to mention that the CONAGUA's Department of Regulation of Right Transfers, Water Banks and Information Control (GRTDBACI in Spanish), through a process of permanent coordination and feedback with the River Basin Organizations and Local Offices, has provided advice and will continue to do so for the start of operations in the Water Banks and their support offices, as well as regarding the delivery of technical tools, access to computing systems and training.

#### 4.4 Operation

The Water Banks and support offices are part of the Integrated Service Centers, with a physical space identified for that purpose, in which they provide their services and advice both in person and virtually.

The main tools and computing systems which are operated are:

- Web page of the Water Banks. Internet site to establish virtual contact with the Water Banks, publish their services, consult information on technical systems, as well as facilitating the registration, consultation and updating of supply and demand for the transfers of rights. It can be accessed from the CONAGUA's website ([www.conagua.gob.mx](http://www.conagua.gob.mx)), in the "links" section or directly through the following address: [www.conagua.gob.mx/bancosdelagua](http://www.conagua.gob.mx/bancosdelagua)
- Printed maps. They serve for users to be able to identify on paper different elements related with water resources management and the transfers of rights.
- Geographic Location System. An interactive system to geographically display the limits of aquifers, prohibition zones, sub-catchments and municipalities.
- Locator of Uses (LOCREPDA). A system that allows geographic information and databases associated with the uses of the nation's water resources to be consulted, along with federal zones, material extraction and wastewater discharges.
- Google Earth. A computer application in which the satellite images contained in the Google Earth program can be consulted on groundwater uses, wastewater discharges, material extraction and federal zones, locating them precisely with geographic references including details such as street names, highways or sites of interest.
- REPDa database. A database available on the Internet, which allows information to be consulted on deeds and permits for the nation's water resources and their inherent public assets, deeds with extraction permits for stone materials and registration of works in free withdrawal zones.
- ArcReader application with technical information. Visualizer of geographic information and databases associated with administrative and technical issues related with water resources.

- REPDA ArcReader application. Visualizer of geographic information and databases associated with concessions and assignments of the nation's water resources and their inherent public assets.

It should be highlighted that the information and elements described previously were obtained by combining efforts developed by different areas of the National Water Commission.

The following flow chart shows in general terms the activities carried out by staff in the Water Banks and their support offices related with advice that is provided to users, attention to supply and demand, management of the procedure to transfer rights and registration of operations in the Follow up System.

Water users  
Sellers  
Buyers

Water Bank  
Provides information and advice and manages the procedure to transfer rights

The users go to the Water Bank to receive guidance and advice

Provides information and advice regarding:

- \* Technical characteristics and hydrological conditions particular to the region
- \* Procedure to transfer rights

Natural persons or legal entities who wish to acquire or transmit water rights go to the Water Bank

Reconcile requirements

Is there reciprocity between requirements?

Yes  
No

The Water Bank makes this known to the interested parties and manages the procedure

Incorporation of the requirement in the Follow up System for future conciliations

Receives advice and complies with the requirements

Guides the user on the requirements for the procedure

Receives the request and integrates the file for the transfer of rights

Receives the corresponding authorization

Registers the data from the procedure in the Follow up System

#### 4.4.1. Follow up

In order to facilitate the follow up of the operation of Water Banks and consult real-time information, the GRTDBACI designed a system that works through the intranet in which the Water Banks and support offices register the advice provided to users, capture satisfaction surveys, follow up on the transfers of rights, as well as the requests of supply and demand. Furthermore, it serves to support the production of operating reports.

It should be highlighted that for each of the Water Banks and support offices, there is a GRTDBACI liaison officer in the central offices to support the follow up on their operation.

Additionally, in order to consolidate the operation of Water Banks and support offices, the GRTDBACI staff periodically carries out follow up site visits to verify that they are functioning correctly.

#### 4.5. Scenarios

Water Banks are a growing project that will continue to progress and be strengthened in such a way that their activity represents both a space of transparency, legal security and trust for the users of the nation's water resources, and an important area of opportunity for the CONAGUA itself, in order for the Water Banks to become a cornerstone for the collection and analysis of information on the trends in demand, supply and the transfer market in Mexico, as well as to analyze the different elements of water management to be thereby able to have a bearing on the specific definition of policies public in accordance with the prevailing conditions in each hydrological region of Mexico.

The period of activity of each of the 13 Water Banks is different since they correspond to the date in which each of them started operations, hence although they share some general characteristics, their degree of progress and maturity also present particularities that respond both to their degree of maturity and the specific universe they cover. It is for this reason that it is especially important to work on the strengthening of these bodies, as well as on their consolidation, seeking on a daily basis a greater *rapprochement* and penetration in the potential of the user public, a clearer attention and resolution of the three modalities of the transfers of rights, a more generalized use of the different support tools, the daily use and improvement of the Follow up System, the formalization and professionalization of staff that as of today, be they temporary or casual, takes part in the tasks of the Bank, the optimization of services, the permanent dissemination of the advantages and options that it represents to make use of these bodies and especially, the collection and analysis of statistical information that allows the Water Banks to also transit as generators of fundamental decisions for the sustainable use of water.

Initial scenario

Management of specific systems and technical tools to provide advice  
Specialized advisors with technical hydrological information on the region  
Facilitators of the procedure to transfer rights  
Information Centers on water resources  
Intensive training on the management of technical support tools

#### Redimensioning scenario

Management of specific systems and technical tools to provide advice  
Specialized advisors with technical hydrological information on the region  
Facilitators of the procedure to transfer rights  
Information Centers on water resources  
Support offices in Local Offices  
Integrated attention of the procedure CNA-01-013 in its three modalities

#### Medium-term scenario

Management of specific systems and technical tools to provide advice  
Specialized advisors with technical hydrological information on the region  
Facilitators of the procedure to transfer rights  
Information Centers on water resources  
Support offices in Local Offices  
Intensive training on the management of technical support tools and follow-up systems and registration of operations carried out  
Integrated attention of the procedure CNA-01-013 in its three modalities  
Information control regarding water management  
Collection and analysis of information on the trends in the right transfer market aiming to design management policies for the resource in accordance with the hydrological administrative region

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